

A database of New Zealand sea lion population monitoring.

POP 2011-01

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Introduction

Improve the availability and integrity of sea lion population monitoring data.

The project will develop a database that collects together all the sightings and mark-recapture data.

Today I am reporting on the schema design for the sightings data.

Data provided by CSP

Existing data is stored in the form of a number of Excel spreadsheets. Updated versions are provided to, and archived by, the Department of Conservation.

The key objective is to provide a more structured storage for these data, and to make it easier to update and access the information stored in them.

Sightings data

Historical NZSL sightings data to March 2008, as an Excel spreadsheet. There are 67 986 records in this dataset, split into 49 055 female and 18 931 male records.

NZSL sightings data from two recent seasons:

- 6 253 for the 2009 season,
- 5 150 for the 2010 season,

An update of the full NZSL sightings data provided in March 2012. This database separates the 89 750 sightings records into 63 602 female and 26 150 male sightings.

Mark-recapture data

An Excel spreadsheet with the worked up mark-recapture data for each of the seven seasons, 2004–05 to 2009–10.

The data included the raw number of animals marked, the numbers counted in each observation, and the final estimate of pup production.

Data has been provided in a semi-structured format.

Sightings data

Current tag	Tag number, and identifier for sea lion
Colour	Colour of tag
Tag shape	Shape of tag, round or coffin

Tags

The tags are attached to sea lions, and used to identify individuals.

To identify a tag uniquely you need:

- shape, either coffin or round
- colour, can be one of 16 different codes
- the printed number, which may contain letters

These three pieces of information will be split into two tables, a `tag_type` table containing shape and colour, and a `tag` table containing the 'numbers', and a link to the tag type.

Round yellow ones are the most common kind of tag.

Sightings data

Date	Date of sighting
Location	Location of sighting
Island	Larger scale description of location
Season of resight	Season (derived)
Nature	Type of resight record
Brand	Animal's brand mark has been identified
Chip	Transponder micro chip
N of tags	Summary of tags recorded
Status	Status of animal at time of sighting
Behaviour comments	General comments
Sight status	Undocumented (1 or 2)?

Locations and islands

The 'where' for each sighting is recorded in two fields: a location, and an island.

The location is strictly contained in an island.

The location information has been groomed to remove potential duplicates, and standardise descriptions. For example:

SEP	→	SOUTH EAST POINT
F8	→	FIGURE OF EIGHT
D	→	DUNDAS ISLAND

Sightings data

Sex	Gender
Original tag	The first tag on the animal
Previous tag	A previous tag, only for six animals
Tag year	Year animal was first tagged
Tag location	Location of initial tagging
Pup tag	Tag of mother's pup
Pup tag colour	Colour of pup tag
Age	Age of animal (derived)
Class	Age class, derived from the date and first tagging (derived)

New Zealand sea lions

Individual animals are uniquely identified by the first time they were tagged.

We store a single record for each sea lion in the `sealion` table:

<code>sex</code>	TEXT	male or female
<code>adult</code>	BOOL	adult when tagged ?
<code>year</code>	TEXT	season initially tagged
<code>tag_id</code>	INT	references the <code>tag</code> table
<code>location_id</code>	INT	references the <code>location</code> table

The 89 750 sightings records have observed (approx.) 17 866 individuals.

Where were sea lions initially tagged?

Putting together the location and sealion tables we can report how many sea lions were newly tagged at each location by year:

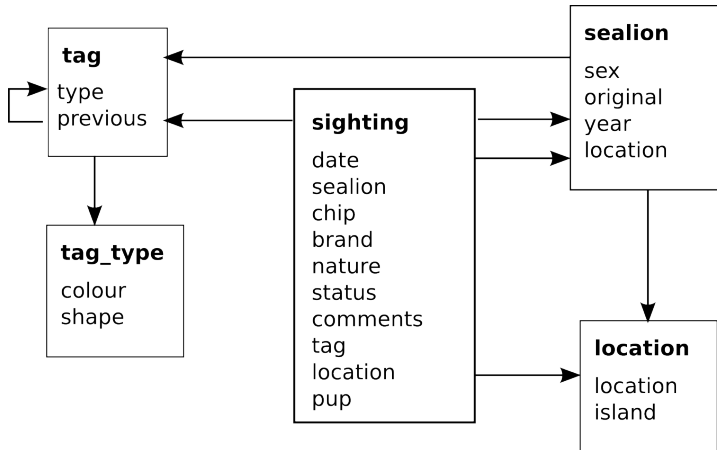
	2011	2010	2009	2008	2007	2006	All
ENDERBY ISLAND	363	377	326	434	457	421	10 086
DUNDAS ISLAND	0	415	405	415	335	428	6 245
CAMPBELL ISLAND	0	404	0	405	0	0	1 157
FIGURE OF EIGHT	31	24	24	42	53	20	376

Sightings

The sightings table pulls together the remaining information:

date	DATE	when sighted
sealion_id	INT	references the sealion table
chip	TEXT	for transponder chip, if checked
brand	TEXT	brand seen
number_of_tags	TEXT	code for how many tags were seen
nature	TEXT	code for type of sighting
status	TEXT	code for animal's status
comments	TEXT	other comments
tag_id	INT	references the tag table
location_id	INT	references the location table
pup_id	INT	references the sealion table

Draft schema diagram



Problems with this schema diagram

The draft schema reflects the structure of the existings spreadsheet. This includes the dual use of the spreadsheet for tracking sea lions and tracking tags. For example, the "CURRENT TAG" field is filled in even if no tags were actually observed.

Some information is currently not being captured, for example the second tag when two are observed.

Brands, chips and tags are all kinds of marks. The tag table currently does not support include brand marks and micro chips.

Next steps

Incorporate the mark-recapture data into database.

Provide access to the database through a web based interface. Prepare documentation on the database, including a summary of grooming rules applied.

Develop a tool for entering, updating, and checking new data. This should capture more details about the identification process.